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A CONTRIBUTION TO THE KNOWLEDGE OF THE DISTRIBUTION
OF PSEUDOTUBERCULOSIS BACILLUS

E. Klein
7 April 1965

A CONTRIBUTION TO THE KNOWLEDGE OF THE DISTRIBUTION
OF PSEUDOTUBERCULOSIS BACILLUS

Following is the translation of an article by E. Klein published in Zbl. Bakt. Abt. I. 26: 260-62, 1899. Translated by B. MacDonald.

As known Malassez and Vignal (Archives of normal pathogenic physiology 1883-1884) then Eberth (Virchow's Archiv. Bd. C and CIII) at first have referred to the presence of cheesy tubercular like knots in the lymph glands, namely in the liver and spleen in the rodent, which, however, did not check the tuberculosis bacillus and Eberth has imparted to this disease process the name of pseudotuberculosis.

A. Pfeiffer (On the bacillary pseudotuberculosis in rodents. Leipzig, 1889) had before anyone else isolated and precisely described the cause of this process and produced the same with cultures both by injection and also by overfeeding the typical disease process to the rodent. The above mentioned authors as well as others before and after A. Pfeiffer (Nocard, Charrin and Rozet, Luboetti, Preisz and Guinard and others) described the pseudotuberculosis of the rodent either as proceeding spontaneously or after the injection of tuberculosis sputum (people and cow) or after the injection from men, calves, sheep, rodents etc. removed cheesy or purulent material.

I have produced the pseudotuberculosis with deposits from sewage liquid of soiled water of 2 rivers, by subcutaneous injection in guinea pigs and rabbits according to the process described by A. Pfeiffer, and have cultivated a pure pseudotubercular bacillus from the necrotic knots of the lymph glands, the liver, spleen and the lungs. Without exception the lethal process of pseudotuberculosis was produced by injection (subcutaneous as well as intramuscular) as well as by overfeeding these cultures in all guinea pigs used. Besides the typical pseudotuberculosis of the lymph glands, the liver and the spleen was produced by this subcutaneous injection in the guinea pig of sewage liquid first filtered through a Cook's filter. Therefrom arises consequently that the pseudotuberculosis bacillus occurs in the sewage liquid and that it probably by their admission is to be found in the above mentioned rivers.

Whatever concerns the morphologic and biologic character of the bacillus, so I have little to add to the give exhaustive description by A. Pfeiffer (l.c.) and by Preisz (Annales de l'Institut Pasteur. 1894. No.4) and these additions concern the following points:

a) the pseudotuberculosis bacillus is an alkalai producer. Bouillon cultures, originally weakly alkalai react after 1-2 weeks strongly alkalai. Indol is not formed.

b) Form coagulated blood serum the microbe grows swiftly and well, it does not flow.

c) To the link formation observed by A. Pfeiffer and also Priesz in bouillon is added, that also in the inflamed part of the lungs of the infected guinea pig, the bacilli frequently were found interwoven in compact snares; similar snarls of bacilli links are found in superficial parts of enlarged and even caseous altered lymph follicles of the Peyer plaques of the ileum and ileocecal valve of the guinea pig, which come in after feeding the pseudotuberculosis bacilli culture.

d) Although the bacilli in pendant drops show no spontaneous movement, however, one or even 2 terminal short spiral column can be detected by the Ermengen silver method in the single bacillus. Pfeiffer has not succeeded in coloring the bacilli according to Gram (l.c. p. 14); one can nevertheless dye the bacilli according to Gram, if one dyes the preparation (smear of the culture or the necrotic-purulent masses of lymph gland, the liver, spleen as well as by cutting the hardened organ) 1 minute in gentian violet anilin water, then wash for 4 minutes in the usual potassium iodide solution of iodine.

e) As regards the distribution of bacilli in the affected organs, I would like to refer to the abundant occurrence of bacilli in the protoplasm of the leucocytes, in the inflamed lymph glands or near the inoculation point, particularly in the knots of the pancreas and the omodynia. In the last are found abundant leucocytes, whose protoplasm is closely filled with bacilli, also in the leucocytes of the young knots of the spleen the case is the same.

Two apes were inoculated with the culture of pseudotuberculosis bacilli. From a suspension on gelatin of an undisturbed colony many drops were injected subcutaneously in the groin. Both animals died, one in 10 and the other in 14 days. A purulent ulcer was found at the point of inoculation, the lymph glands of the groin were swollen, and contained pus inside; the liver was severely swollen, plethoric and contained about half a dozen whiter, some about the size of a hempseed, round awkward knots, the spleen was enlarged, dark red and had near the cap small white roundish knots. Both in cover glass preparations and also in cuts of the affected organ, as well as by the culture method procedure the pseudotuberculosis bacilli were abundantly detected.

It is not unlikely after these experiments on the apes that man would also be receptive and after them, which was pointed out before about the occurrence of microbes in contaminated river water and in sewage water can cause an infection in man with pseudotuberculosis. Therefore, the case of pseudotuberculosis described by DoCozal and Vaillard (1891) and especially the observation by Malssez and Vignal (l.c.) by means of caseous (not tuberculous) knots on the forearm of dead children in respect to meningitis-tuberculosis have produced pseudotuberculosis by inoculation in rodents.

19 July 1899.